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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No.	Applicant(s)	
	10/736,939	MACOURS, CHRISTOPHE MARC	
	Examiner	Art Unit	
	BRIAN L. ALBERTALLI	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-8,10,11,13-20,22-27 and 29-31* is/are rejected.

7)☒ Claim(s) *5,9,12,21 and 28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-31 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claim 29 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 29 is directed to a computer program. A computer program is not a statutory category of invention. In contrast, claim 30 is statutory, because claim 30 is directed to a computer program product comprising program code means.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 2, 18, and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As currently amended, independent claims 1, 2, 18, and 19 appear to use the phrase “average gain factor” to refer to two distinct concepts. As such, the meaning of the phrase “average gain factor” cannot be accurately determined, and the claims are indefinite.

Claims 1, 2, 18, and 19 each recite a first limitation, “wherein the average gain factor for the first range is greater than the average gain factor for the second range”, and a second limitation, “such that the average gain factor for the first range lies at least 6 dB below that for the second range”. At first glance, this statement appears to be contradictory. That is, the average gain factor for the first range is first required to be "greater" than the average gain factor of the second range. However, in the second limitation the average gain factor for the first range is required to lie at least 6 dB below the second range. It is clear, therefore, that the "average gain factor" as used in the first limitation is different the “average gain factor” used in the second limitation.

A review of the specification reveals that the “average gain factor” has an explicit definition. As described on pages 13 and 14 of the Applicant’s specification, the average gain factor “can be computed by summing up the gain factors (z) multiplied with the strength of the input level and then dividing by the sum of the strength of the levels”. Given this definition, the first limitation above would be consistent with the specification, and particularly the exemplary Fig. 5. Using the above definition, the strongest signals (those with y-values close to zero) contribute more to the average gain factor than the very weak signals (y-values of -30 dB or less). Thus, the first range (i.e.

the stronger signals) has a higher average gain factor than the second range (i.e. the weaker signals).

The use of the phrase “average gain factor” in the second limitation, then, does not appear to be consistent with the explicit definition set forth in the specification and recited above. Rather, reviewing Fig. 5 and the overall specification reveals that in the second limitation, “average gain factor” most likely refers to the average gain level difference (D in Fig 5) between the first range and the second range. That is, the unvoiced phonemes that are present in the second range are boosted at least 6 dB more than the voiced phonemes in the first range (i.e. the average gain level difference for the first range is at least 6 dB below that for the second range). This interpretation is consistent with Fig. 5 and particularly the description of the invention on page 17, lines 30-35 of the specification.

Thus, for the purposes of examination, the claims will be interpreted as set forth above. An amendment to the claims differentiating between the "average gain level" and "average gain level difference" would overcome this rejection, and remain consistent with the Examiner’s understanding of the invention.

If this interpretation is incorrect, the Applicant is invited to explain how the “average gain factor" for the first range can be both “greater than the average gain factor for the second range” and “at least 6 dB below that for the second range".

6. Claim 25 recites the limitation "the fifth range" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 31 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language (i.e. “for performing the action specific for the invention"). This claim is an omnibus type claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-4, 6, 8, 10, 17-20, 22, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Goldstein (U.S. Patent Application Publication 2002/0057808).

It should be noted prior to the rejections below that Goldstein uses a different dB scale for the input signal than the Applicant. Goldstein uses a dB SPL scale with reference to a hearing threshold (i.e. 0 dB SPL equals the threshold of hearing and dB levels extend positively to 120 dB SPL). This is in contrast to the Applicant's use of dB Full Scale, where 0 dB represents the highest level possible and the range extends negatively to -90 dB and below. Thus, for the purposes of examination, the 120 dB SPL disclosed by Goldstein (the maximum input level disclosed by Goldstein in Figs. 4-6) will be considered the maximum input and thus equivalent to the Applicant’s 0 dB Full Scale. The scaling will therefore be interpreted such that, e.g. 100 dB SPL in Goldstein will equal -20 dB, 80 dB SPL in Goldstein will equal -40 dB, etc.

In regard to claim 1, Goldstein discloses a sound reproduction or recording system (Fig. 1) comprising an audio input signal (sound pressure signal provided to input 102, page 5, paragraph 61), an audio signal processor (the amplification device is implemented as a DSP, page 11, paragraph 131) and an audio signal output (output 116, page 5, paragraph 62) wherein

the audio signal processor comprises an attributor for attributing a gain factor to input signals as a function of input level (adaptive nonlinear amplifier 108 provides a gain characteristic as a function of input sound level, page 5, paragraph 61)

with a functional relationship such that the function relationship between the gain factor and the input level comprises a first range and a second range (see Fig. 5, a first range from 120 dB SPL to 100 SPL dB and a second range below 100 dB SPL),

the first range covering amplitudes in which mainly voiced phonemes are situated (according to Applicant's specification, this voiced phonemes range is a range from a maximum input to at least 10 dB from the maximum, preferably at least 15 dB, but no more than 30 dB; equivalently, Goldstein discloses a first range that extends from the maximum 120 dB SPL to 20 dB from the maximum at 100 dB SPL, page 8, paragraph 102)

the second range situated at input levels lower than those for the first range and covering amplitudes in which mainly unvoiced phonemes are situated (according to Applicant's specification, this unvoiced phonemes range extends 15-35 dB below range I so that the extent of ranges I and II combined is 30-75 dB, Goldstein discloses a

second range that extends from 80 dB SPL to 50 dB SPL which extends 30 dB below the first range set forth above and combined, the extend of ranges I and II would be 120 dB SPL – 50 db SPL = 70 dB SPL, page 8, paragraph 102)

wherein the average gain factor for the first range is greater than the average gain factor for the second range (using the Applicant's definition of "average gain factor" given in the specification on pages 13 and 14, when using the same scaling factor as the applicant (where 0 dB=120 dB SPL in Goldstein), the weaker signals of range II would inherently hardly contribute to the average gain factor, and the strongest signals of the first range would inherently contribute most to the average gain factor, thus the average gain factor of range I would be greater than the average gain factor of range II)

such that the average gain factor (assumed to be average gain factor <u>difference</u>) for the first range lies at least 6 dB below that for the second range (in range I from 120 dB SPL to 100 dB SPL, the gain factor is approximately 0 dB, whereas the gain factor in range II from 80 dB SPL to 50 dB SPL is between approximately between 10 dB and 20 dB, averaging to approximately 15 dB, page 8 paragraph 102).

In regard to claim 2, Goldstein discloses a sound reproduction or recording system (Fig. 21), comprising a digital audio signal input (analog to digital converter, page 11, paragraph 131), a digital audio processor (digital signal processor, page 11, paragraph 131), and a digital audio signal output (digital to analog converter, page 11, paragraph 131) wherein

the digital audio signal processor comprises an attributor for attributing a gain factor to input signals as a function of input level (adaptive nonlinear amplifier 108 provides a gain characteristic as a function of input sound level, page 5, paragraph 61; and is implemented by the DSP, 11, paragraph 13),

wherein the functional relationship between the gain factor and the input level is such that a first and second range are present (see Fig. 5, a first range from 120 dB SPL to 100 SPL dB and a second range below 100 dB SPL),

the first range extending from a maximum value input (120 dB SPL) downwards at least 10 dB (Fig. 5, range I extends from 120 db SPL to 100 dB SPL, i.e. down 20 dB SPL, page 8, paragraph 102),

the second range extending at input levels below the first range, said second range covering a range of 10 dB or more (Fig. 5, range II extends from 80 dB SPL to 50 dB SPL, being below range I and covering a range of 30 dB, page 8, paragraph 102),

wherein the average gain factor for the first range is greater than the average gain factor for the second range (using the Applicant's definition of "average gain factor" given in the specification on pages 13 and 14, when using the same scaling factor as the applicant (where 0 dB=120 dB SPL in Goldstein), the weaker signals of range II would inherently hardly contribute to the average gain factor, and the strongest signals of the first range would inherently contribute most to the average gain factor, thus the average gain factor of range I would be greater than the average gain factor of range II)

such that the average gain factor (assumed to be average gain factor <u>difference</u>) for the first range lies at least 6 dB below that for the second range (in range I from 120

dB SPL to 100 dB SPL, the gain factor is approximately 0 dB, whereas the gain factor in range II from 80 dB SPL to 50 dB SPL is between approximately between 10 dB and 20 dB, averaging to approximately 15 dB, page 8 paragraph 102).

In regard to claim 3, Goldstein discloses the attributor is arranged such that the first range extends from the maximum value input level at least 15 dB, but not more than 30 dB (Fig. 5, range I extends from the maximum 120 db SPL to 100 dB SPL, i.e. down 20 dB SPL, page 8, paragraph 102).

In regard to claim 4, Goldstein discloses the attributor is arranged such that the gain factor in the first range is at least 12 dB lower than in the second range (in range I from 120 dB SPL to 100 dB SPL, the gain factor is approximately 0 dB, whereas the gain factor in range II from 80 dB SPL to 50 dB SPL is between approximately between 10 dB and 20 dB, averaging to approximately 15 dB, page 8 paragraph 102).

In regard to claim 6, Goldstein discloses the system comprises a dynamic level detector having an input for the signal amplitude and an output for providing an average level over a predetermined time period (the RMS level of an input sound signal is determined by controller 130, RMS is equivalent to the average level of a signal and must inherently be determined over a set time period, page 12, paragraph 139).

In regard to claim 8, Goldstein discloses the attributor is arranged such that the gain factor in the first range is on average below 6 dB (Fig. 5, in range I from 120 dB SPL to 100 dB SPL, the gain factor is approximately 0 dB, page 8, paragraph 102).

In regard to claim 10, Goldstein disclose the attributor is arranged such that the functional relationship between the gain factor and the input level is such that between the first and second ranges a third, intermediate range is present in which the gain factor changes gradually (Fig. 5, between 80 dB SPL and 100 dB SPL, the gain factor gradually changes from approximately 10 dB to 0 dB, page 8, paragraph 102).

In regard to claim 17, Goldstein discloses the signal processor is a digital signal processor (the amplification device is implemented as a DSP, page 11, paragraph 131).

In regard to claim 18, Goldstein discloses a method for audio signal enhancement in or for a sound reproduction or recording system (Fig. 1), wherein input signals are multiplied with a gain factor, said gain factor being a function of input level (adaptive nonlinear amplifier 108 provides a gain characteristic as a function of input sound level, page 5, paragraph 61), wherein

the functional relationship between the gain factor and the input level is such that a first and second range are present (see Fig. 5, a first range from 120 dB SPL to 100 SPL dB and a second range below 100 dB SPL),

the first range covering amplitudes in which mainly voiced phonemes are situated (according to Applicant's specification, this voiced phonemes range is a range from a maximum input to at least 10 dB from the maximum, preferably at least 15 dB, but no more than 30 dB; equivalently, Goldstein discloses a first range that extends from the maximum 120 dB SPL to 20 dB from the maximum at 100 dB SPL, page 8, paragraph 102)

the second range situated at input levels lower than those for the first range and covering amplitudes in which mainly unvoiced phonemes are situated (according to Applicant's specification, this unvoiced phonemes range extends 15-35 dB below range I so that the extent of ranges I and II combined is 30-75 dB, Goldstein discloses a second range that extends from 80 dB SPL to 50 dB SPL which extends 30 dB below the first range set forth above and combined, the extend of ranges I and II would be 120 dB SPL – 50 db SPL = 70 dB SPL, page 8, paragraph 102)

wherein the average gain factor for the first range is greater than the average gain factor for the second range (using the Applicant's definition of "average gain factor" given in the specification on pages 13 and 14, when using the same scaling factor as the applicant (where 0 dB=120 dB SPL in Goldstein), the weaker signals of range II would inherently hardly contribute to the average gain factor, and the strongest signals of the first range would inherently contribute most to the average gain factor, thus the average gain factor of range I would be greater than the average gain factor of range II)

such that the average gain factor (assumed to be average gain factor <u>difference</u>) for the first range lies at least 6 dB below that for the second range (in range I from 120

dB SPL to 100 dB SPL, the gain factor is approximately 0 dB, whereas the gain factor in range II from 80 dB SPL to 50 dB SPL is between approximately between 10 dB and 20 dB, averaging to approximately 15 dB, page 8 paragraph 102).

In regard to claim 19, Goldstein discloses a method for audio signal enhancement in or for a sound reproduction or recording system (Fig. 1), wherein input signals are multiplied with a gain factor, said gain factor being a function of input level (adaptive nonlinear amplifier 108 provides a gain characteristic as a function of input sound level, page 5, paragraph 61), wherein

the functional relationship between the gain factor and the input level is such that a first and second range are present (see Fig. 5, a first range from 120 dB SPL to 100 SPL dB and a second range below 100 dB SPL),

the first range extending from a maximum value input (120 dB SPL) downwards at least 10 dB (Fig. 5, range I extends from 120 db SPL to 100 dB SPL, i.e. down 20 dB SPL, page 8, paragraph 102),

the second range extending at input levels below the first range, said second range covering a range of 10 dB or more (Fig. 5, range II extends from 80 dB SPL to 50 dB SPL, being below range I and covering a range of 30 dB, page 8, paragraph 102),

wherein the average gain factor for the first range is greater than the average gain factor for the second range (using the Applicant's definition of "average gain factor" given in the specification on pages 13 and 14, when using the same scaling factor as the applicant (where 0 dB=120 dB SPL in Goldstein), the weaker signals of range II

would inherently hardly contribute to the average gain factor, and the strongest signals of the first range would inherently contribute most to the average gain factor, thus the average gain factor of range I would be greater than the average gain factor of range II)

such that the average gain factor (assumed to be average gain factor difference) for the first range lies at least 6 dB below that for the second range (in range I from 120 dB SPL to 100 dB SPL, the gain factor is approximately 0 dB, whereas the gain factor in range II from 80 dB SPL to 50 dB SPL is between approximately between 10 dB and 20 dB, averaging to approximately 15 dB, page 8 paragraph 102).

In regard to claim 20, Goldstein discloses In regard to claim 4, Goldstein discloses the gain factor in the first range is at least 12 dB lower than in the second range (in range I from 120 dB SPL to 100 dB SPL, the gain factor is approximately 0 dB, whereas the gain factor in range II from 80 dB SPL to 50 dB SPL is between approximately between 10 dB and 20 dB, averaging to approximately 15 dB, page 8 paragraph 102).

In regard to claim 22, Goldstein discloses the functional relationship between the gain factor and the input level is such that between the first and second ranges a third, intermediate range is present in which the gain factor changes gradually (Fig. 5, between 80 dB SPL and 100 dB SPL, the gain factor gradually changes from approximately 10 dB to 0 dB, page 8, paragraph 102).

In regard to claim 26, Goldstein discloses the functional relationship between the gain factor and the input level is such that unvoiced phonemes are at least 6 dB more enhanced than voice phonemes (Fig. 5, since ranges I and II correspond with the levels of voiced phonemes and unvoiced phonemes, respectively, as defined by the Applicant's specification, and range II is amplified by at least 10 dB more than range I, Goldstein's functional relationship would inherently enhance the unvoiced phonemes at least 6 dB more than the voiced phonemes, page 8, paragraph 102).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goldstein, in view of Kosanovic (U.S. Patent 6,157,670).

While Goldstein discloses determining an average level of the signal (RMS), Goldstein does not disclose the predetermined time period is 1 to 5 milliseconds.

Kosanovic discloses determining the average value (RMS) of a signal over a predetermined time period of 1 to 5 milliseconds (the RMS of a signal is calculated over 2.5 millisecond blocks, column 2, line 58 to column 3, line 1).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Goldstein to determine the average level of the signal every 1 to 5

milliseconds, because such a short time period would ensure that the instantaneous average level of the signal would be accurately tracked, thus the gain factor would be adjusted to the optimal settings for boosting the input signal.

12. Claims 11, 16, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldstein, in view of Allen et al. (U.S. Patent 5,553,134).

In regard to claim 11, Goldstein et al. briefly mention that the gain function could be adjusted based on background noise (page 3, paragraph 25), but does not specifically disclose a sensor for measuring background noise, and an adjustor for adjusting the gain factor in the second range in dependency on the measured background noise.

Allen et al. disclose a system comprising an attributor for attributing a gain factor to input signals as a function of input level (see Fig. 5), comprising a sensor for measuring background noise (noise floor estimator 36, column 6, lines 8-9), and an adjustor for adjusting the gain factor in the second range in dependency on the measured background noise (the gain factor GL for a 2^{nd} range BK to 0 is set based on a GAIN computation, column 8, lines 4-6; the GAIN computation is based on the measured noise floor signal, column 5, lines 1-4).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Goldstein to adjust the gain factor in the second range based on the measured background noise, so background noise would not be excessively amplified,

while low level speech signals would still receive a sufficient boost, as taught by Allen et al. (column 8, lines 15-21).

In regard to claim 16, Goldstein differs from the claimed device because Goldstein does not disclose the sound reproduction system is a mobile telephone system.

Allen et al. disclose a mobile telephone system (cellular telephone, column 2, lines 42-59) that utilizes a similar signal enhancement technique (see gain factor plot of Fig. 5) for enhancing the input signal (column 8, lines 12-34).

One of ordinary skill in the art at the time of invention could have substituted the non-linear gain correction of Goldstein for the non-linear gain correction of Allen and the result of the substitution would predictably result in a mobile telephone system with a non-linear gain correction function as disclosed by Goldstein.

In regard to claim 27, Goldstein discloses a method for audio signal enhancement in a sound reproduction system (Fig. 1) in which an incoming signal is digitally processed wherein input signals are multiplied by a gain factor, said gain factor being a function of input level (adaptive nonlinear amplifier 108 provides a gain characteristic as a function of input sound level, page 5, paragraph 61; and is implemented by the DSP, 11, paragraph 13),

wherein the functional relationship between the gain factor and the input level is such that unvoiced phonemes are at least 6 dB more enhanced than voiced phonemes

(according to Applicant's specification, this voiced phonemes range is a range from a maximum input to at least 10 dB from the maximum, preferably at least 15 dB, but no more than 30 dB; equivalently, Goldstein discloses a first range that extends from the maximum 120 dB SPL to 20 dB from the maximum at 100 dB SPL, page 8, paragraph 102; according to Applicant's specification, this unvoiced phonemes range extends 15-35 dB below range I so that the extent of ranges I and II combined is 30-75 dB, Goldstein discloses a second range that extends from 80 dB SPL to 50 dB SPL which extends 30 dB below the first range set forth above and combined, the extend of ranges I and II would be 120 dB SPL – 50 db SPL = 70 dB SPL, page 8, paragraph 102; in range I from 120 dB SPL to 100 dB SPL, the gain factor is approximately 0 dB, whereas the gain factor in range II from 80 dB SPL to 50 dB SPL is between approximately between 10 dB and 20 dB, averaging to approximately 15 dB, page 8 paragraph 102);

wherein the gain factor for the unvoiced phonemes is greater than zero (the gain factor in range II from 80 dB SPL to 50 dB SPL is between approximately between 10 dB and 20 dB, averaging to approximately 15 dB, page 8 paragraph 102);

the gain factor for the unvoiced phonemes being fixed at a particular level (Goldstein sets the gain corrections at a fixed level, page 8, paragraph 101).

Goldstein does not disclose the voiced phoneme gain factor is greater than zero, or that the gain factor for the voiced phonemes is varied such that the gain factor is decreased inversely with respect to the input level of the phonemes.

Allen et al. disclose a system comprising an attributor for attributing a gain factor to input signals as a function of input level (see Fig. 5), wherein a gain factor in the

voiced phoneme range is greater than zero (Fig. 5, the upper range limit P is set at a high level gain GH at a level that would approximate the level of voiced phonemes, i.e. about 10% the total signal strength, column 8, lines 24-31); and

the gain factor for the voiced phonemes is varied such that the gain factor is decreased inversely with respect to the input level of the phonemes (the high-level gain is inversely proportional to the average speech power level, column 9, lines 49-51).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Goldstein to boost the voiced phoneme gain factor above zero and to base the voiced phoneme gain factor as a function of the input level, because adding high level gain (in the voiced phoneme range) based on the input power level allows the user to boost the loudness of the signal while still keeping the enhanced intelligibility of low-level gain (in the unvoiced phoneme range), as taught by Allen et al. (column 9, line 55 to column 10, line 4).

13. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldstein in view of Official Notice.

Goldstein does not specifically disclose computer program code or a computer program product comprising code for performing the method of claim 18.

Official Notice is taken that it is notoriously well known to represent a method as computer program code stored on a computer program product, because this allows a computer to read the code and execute the process represented by the computer program code and allows the process to be realized.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Goldstein to represent method as computer program code stored on a computer program product, because this would allow a computer to read the code and execute the process represented by the computer readable code and allows the process to be realized.

Allowable Subject Matter

14. Claims 5, 9, 12, 21, and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 5, 21, and 28, Goldstein discloses the average gain factor in the preferred range of the invention is around 20 dB (see Fig. 7, at the preferred compression ratio range of -5 dB to 5 dB, the RMS gain is approximately 20 dB). Similarly, Allen et al. disclose a maximum gain factor limit of 15 dB (column 7, lines 10-12). There is no teaching or suggestion in Goldstein or Allen et al. to limit the average gain factor so that the average gain factor for the first and second ranges is less than 3 dB.

Regarding claim 9, Goldstein does not disclose or suggest a determinator for determining a maximum level of input and equating the maximum input level with the upper edge of the first range. Allen et al. disclose determining a maximum level of input, but suggest that the upper edge of a first range should be set so that the upper

level is exceeded 10% of the time (thus the upper edge is lower than the maximum input level, see column 8, lines 29-31).

Regarding claim 12, Goldstein discloses (Fig. 5) that the gain function remains at 20 dB below 60 dB SPL. Similarly, Allen et al. disclose the gain function remains linear at a level GL below a particular breakpoint level BK (see Fig. 5 and column 8, lines 12-34). There is no suggestion in Goldstein Allen et al. to include a fourth range juxtaposed at a lower boundary value to the second range where the gain factor in the fourth range is substantially zero.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Franklin et al. (U.S. Patent 5,794,187) disclose a non-linear gain factor, but boost voiced phonemes and suppress unvoiced phonemes. Cummins et al. (U.S. Patent 4,887,299) disclose a hearing aid that utilizes a non-liner gain factor.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN L. ALBERTALLI whose telephone number is (571)272-7616. The examiner can normally be reached on Monday-Thursday, 8 AM to 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/David R Hudspeth/
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